

Docket No. 0083-0865-2

IN RE APPLICATION OF: Masashi GOTOH, et al.

SERIAL NO: 09/119,626

RCE FILED: December 6, 2001

FOR: CIRCUIT BOARD HAVING BONDING AREAS TO BE JOINED WITH BUMPS BY ULTRASONIC BONDING



2841

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

SIR:

Transmitted herewith is an amendment in the above-identified application.

- ☒ No additional fee is required
- ☐ Small entity status of this application under 37 C.F.R. §1.9 and §1.27 is claimed.
- ☒ Additional documents filed herewith: Marked-up Copy of Amendment

The Fee has been calculated as shown below:

CLAIMS	CLAIMS REMAINING		HIGHEST NUMBER PREVIOUSLY PAID	NO. EXTRA CLAIMS	RATE	CALCULATIONS
TOTAL	11	MINUS	20	0	× \$18 =	\$0.00
INDEPENDENT	3	MINUS	3	0	× \$84 =	\$0.00
		<input type="checkbox"/> MULTIPLE DEPENDENT CLAIMS			+ \$280 =	\$0.00
		TOTAL OF ABOVE CALCULATIONS				\$0.00
		<input type="checkbox"/> Reduction by 50% for filing by Small Entity				\$0.00
		<input type="checkbox"/> Recordation of Assignment			+ \$40 =	\$0.00
		TOTAL				\$0.00

- ☐ A check in the amount of _____ is attached.
- ☒ Please charge any additional Fees for the papers being filed herewith and for which no check is enclosed herewith, or credit any overpayment to deposit Account No. 15-0030. A duplicate copy of this sheet is enclosed.
- ☒ If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136, and any additional fees required under 37 C.F.R. §1.136 for any necessary extension of time may be charged to Deposit Account No. 15-0030. A duplicate copy of this sheet is enclosed.

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0083-0865-2



IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF: :
Masashi GOTOH, et al. : EXAMINER: CUNEO, K.
SERIAL NO.: 09/119,626 :
RCE FILED: December 6, 2001 : GROUP ART UNIT: 2841
FOR: CIRCUIT BOARD HAVING :
BONDING AREAS TO BE
JOINED WITH BUMPS BY
ULTRASONIC BONDING

RECEIVED
APR 15 2002
TC 2800 MAIL ROOM

#32
Anshu E
J. White
4-18-02

AMENDMENT

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

SIR:

In response to the Office Action dated January 14, 2002, please amend the above-identified application as follows:

IN THE CLAIMS

Claim 16 is amended as follows:

16. (Once Amended) A chip part device comprising:

a circuit board including a board main body and a conductive layer formed on said board main body, said conductive layer having a plurality of bonding areas defined by a conductive pattern; and

a chip element mounted on said circuit board, and having a plurality of bump electrodes which are joined with said bonding areas by ultrasonic bonding,

E)

E1
cont

wherein said circuit board includes at least two grooves defined by said conductive pattern, and located approximate to one of said bonding areas to put the bonding area therebetween, and wherein said at least two grooves do not extend into said board main body.

Please add new Claims 19-26, as follows:

E2

19. (New) A chip part device comprising:

a circuit board including a board main body and a conductive layer formed on said board main body, said conductive layer having a plurality of bonding areas defined by a conductive pattern; and

a chip element mounted on said circuit board, and having a plurality of bump electrodes which are joined with said bonding areas by ultrasonic bonding,

wherein said circuit board includes at least two grooves defined by said conductive pattern and located approximate to one of said bonding areas to put the bonding area therebetween, and wherein at least one of said grooves does not electrically isolate said conductive pattern.

20. (New) A chip part device as claimed in claim 19, wherein said groove is formed extending in a direction traversing an ultrasonically vibrating direction of the ultrasonic bonding.

21. (New) A chip part device as claimed in claim 19, wherein said at least two grooves is provided in said conductive layer as at least one of an isolated notch part and a recess located proximate to and not extending within said one of said bonding areas, wherein said notch part or recess partially narrows said conductive pattern to form a narrow pattern part.

22. (New) A chip part device comprising:

a circuit board including a board main body and a conductive layer formed on said board main body, said conductive layer having a plurality of bonding areas defined by a conductive pattern; and

E2
(cont)
a chip element mounted on said circuit board, and having a plurality of bump electrodes which are joined with said bonding areas by ultrasonic bonding,

wherein said circuit board includes means for evenly distributing ultrasonic energy applied in a vibrating direction to said plurality of bump electrodes and said plurality of bonding areas.

23. (New) A chip part device as claimed in claim 22, wherein said means for distributing ultrasonic energy comprises at least two grooves defined by said conductive pattern and located approximate to one of said bonding areas to put the bonding area therebetween, and wherein at least one of said grooves does not electrically isolate said conductive pattern.

24. (New) A chip part device as claimed in claim 22, wherein said means for evenly distributing ultrasonic energy comprises at least two grooves defined by said conductive pattern and located approximate to one of said bonding areas to put the bonding area therebetween, and wherein said at least two grooves do not extend into said board main body.

25. (New) A chip part device as claimed in claim 24, wherein said groove is formed extending in a direction traversing an ultrasonically vibrating direction of the ultrasonic bonding.

26. (New) A chip part device as claimed in claim 24, wherein said at least two grooves is provided in said conductive layer as at least one of an isolated notch part and a recess located proximate to and not extending within said one of said bonding areas, wherein said notch part or recess partially narrows said conductive pattern to form a narrow pattern part.

REMARKS

Favorable reconsideration of this application as presently amended is respectfully requested.

Claims 16-26 are presently active in this case, Claim 16 having been amended and Claims 19-26 having been added by way of the present amendment.

Claims 16-18 were rejected under 35 U.S.C. 103(a) as being unpatentable over Figure 11 of the present application in view of Mims (U.S. Patent No. 3,893,223). For the reasons discussed below, the Applicants request the withdrawal of the obviousness rejection.

Amended Claim 16 of the present application recites a chip part device comprising a circuit board including a board main body and a conductive layer formed on the board main body, and a chip element mounted on the circuit board. The conductive layer has a plurality of bonding areas defined by a conductive pattern. The chip element has a plurality of bump electrodes which are joined with the bonding areas by ultrasonic bonding. The circuit board advantageously includes at least two grooves defined by the conductive pattern, and located approximate to one of the bonding areas to put the bonding area therebetween, and the at least two grooves do not extend into the board main body.

The Applicants submit that a *prima facie* case of obviousness cannot be established in the present case because the cited references do not teach or suggest, either singularly or in combination, all of the limitations expressly recited in amended Claim 16 of the present invention. (See MPEP 2143.) More specifically, the cited references do not disclose or suggest a chip part device comprising a circuit board including a board main body and a conductive layer formed on the board main body, where the conductive layer has a plurality of bonding areas defined by a conductive pattern, and where the circuit board includes at least two grooves defined by the conductive pattern, and located approximate to one of the

bonding areas to put the bonding area therebetween, and the at least two grooves do not extend into the board main body.

Figure 11 is cited for the teaching of a general chip part device. However, as noted in the Office Action, Figure 11 does not disclose two grooves proximate a bonding area to place the area therebetween. The Office Action cites the Mims reference for the teaching of “grooves (with the conductive material all the way removed) on either side of a bonding area where a row of bonding areas is being ultrasonically attached.”

The present invention recites a circuit board including a board main body and a conductive layer formed on the board main body, where the circuit board includes at least two grooves defined by a conductive pattern, and the at least two grooves do not extend into the board main body. The Mims reference describes a method for spot welding sheet members by vibratory energy, where weld locations are decoupled from adjacent weld locations by forming apertures, slots, holes, or cutouts that extend the full depth of a single-layered workpiece. The Mims reference does not disclose or suggest decoupling a device having a main body and a layer thereon by defining a groove in the layer that does not extend into the main body. Additionally, the Mims reference does not disclose or suggest modifying the invention described therein for use in a device having a main body and a layer thereon.

The Applicants, therefore, respectfully submits that the rejection is based on the improper application of hindsight considerations. It is well settled that it is impermissible simply to engage in hindsight reconstruction of the claimed invention, using Applicants' structure as a template and selecting elements from the references to fill in the gaps. *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991). Recognizing, after the fact, that a modification of the prior art would provide an improvement or advantage, without suggestion thereof by the prior art, rather than dictating a conclusion of obviousness, is an

indication of improper application of hindsight considerations. Simplicity and hindsight are not proper criteria for resolving obviousness. *In re Warner*, 397 F.2d 1011, 154 USPQ 173 (CCPA 1967).

Even assuming for the sake of argument that one of skill in the art have considered both the Mims reference and Figure 11, it is unclear from the Mims reference whether the decoupling method described therein would perform sufficiently in a device having a main body and a layer thereon, since no suggestion is provided for such a modification. Based upon the teachings of the Mims reference, one of skill in the art would have been lead to believe that by forming the slot only through layer, the main body would still act as a coupling between the welding points, thereby causing damage to adjacent welding points. Accordingly, one of skill in the art would not have been motivated to combine the teachings of the Mims reference with Figure 11 of the present application.

Claims 17 and 18 are considered allowable for the reasons advanced for Claim 16 from which they depend. These claims are further considered allowable as they recite other features of the invention that are neither disclosed, taught, nor suggested by the applied references when those features are considered within the context of Claim 16.

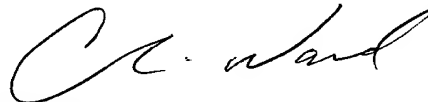
Accordingly, the Applicants respectfully request the withdrawal of the obviousness rejection.

Newly added Claims 19-26 are considered allowable as they recite features of the invention that are neither disclosed, taught, nor suggested by the references of record. The Applicants note that means plus function limitations should be examined in light of and consistent with the written description of the invention in the application, as per the Federal Circuit decision in *In re Donaldson*. (See MPEP 2181.)

Consequently, in view of the above discussion, it is respectfully submitted that the present application is in condition for formal allowance and an early and favorable reconsideration of this application is therefore requested.

Respectfully submitted,

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